GREENHECK

Model SMD-301M

Smoke Dampers

Steel Airfoil Blades
UL 555S Leakage Class I

APPLICATION

Model SMD-301M is a leakage rated modulating smoke damper with class I leakage. The SMD-301M serves the function of both a control damper and smoke damper. High strength airfoil blades insure lowest resistance to airflow in HVAC systems with velocities to 2000 fpm (10.2m/s) and 4 in. wg (1 kPa) Model SMD-301M may be installed vertically (with blades running horizontal) or horizontally and is rated for airflow and leakage in either direction.

Model SMD-301M meets the requirements for smoke dampers established by:

National Fire Protection Association
NFPA Standards 92A, 92B, 101 & 105

IBC International Building Codes

New York City (MEA listing #260-91-M)

CSFM California State Fire Marshal
Leakage (Smoke) Damper Listing (#3230-0981:104)

"UL CLASSIFIED (see complete marking on product)"
"UL CLASSIFIED to Canadian safety standards (see complete marking on product)"
Standard 555S (Listing #R13317)

UL 555S Leakage Rating

Leakage Class: I

Operational Rating

Maximum Velocity: 2000 fpm (10.2m/s)
Maximum Pressure: 4 in. wg (1 kPa)
Maximum Temperature: 250°F (121°C)

STANDARD CONSTRUCTION

Frame: 5 in. x 1 in. (127mm x 25mm) galvanized steel hat channel with reinforced corners. A low profile head and sill are used on sizes less than 17 in. (432mm) high to maximize free area and performance.

Blades: Double skin airfoil shape of galvanized steel with full length structural reinforcement. 14 ga. (2 mm) equivalent thickness.

Seals: Extruded silicone rubber blade seals. Flexible stainless steel jamb seals.

Linkage: Concealed in jamb.

Axles: 1/2 in. (13mm) dia. plated steel.

Bearings: Bronze sleeve type.

SIZE LIMITATIONS:

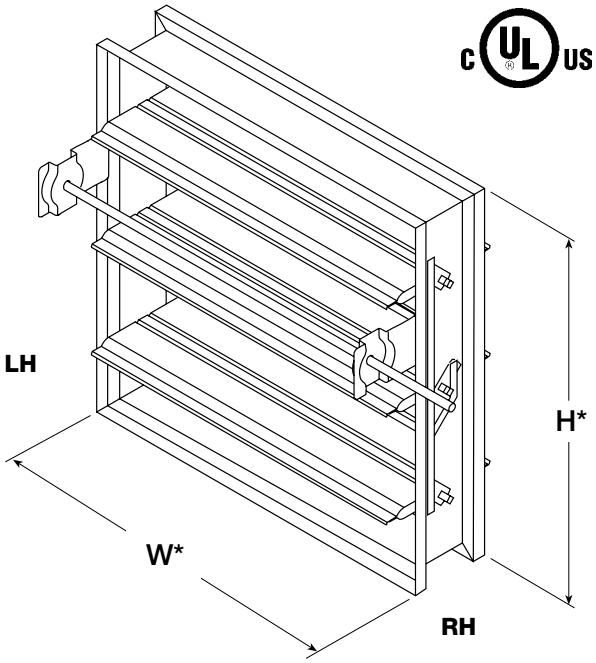
Minimum Size: 8 in. W x 6 in. H (203mm W x 152mm H)

Maximum Size:
Single Section - 32 in. W x 50 in. H (813mm W x 1270mm H)
Multiple Section - 128 in. W x 100 in. (3251mm W x 2540mm H)

OPTIONAL FEATURES:

- Galvanized steel sleeves.
- Stainless steel bearings
- OCI (Open closed indication switches)
- Electric actuators to accomplish smoke management and system functions.
- Transitions (R, C, O)
- POC retaining angles
- Momentary Switch
- Smoke detectors
- Sealed transitions and sleeves

Greenheck Fan Corporation certifies that the model SMD-301M shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to air performance ratings only.



*W&H dimensions furnished approximately 1/4 in. (6mm) undersize. Right hand drive is shown. Left hand drive is available upon request. Damper also may be rotated 180° in the field for opposite side drive.
(Add sleeve thickness for overall sleeved damper dimension)

Installation instructions available at www.greenheck.com

Pressure Drop Data SMD-301M

This pressure drop testing was conducted in accordance with AMCA Standard 500-D using the three configurations shown. All data has been corrected to represent standard air at a density of .075 lb/ft^3 (1.201 kg/m^3).

Actual pressure drop found in any HVAC system is a combination of many factors. This pressure drop information along with an analysis of other system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

AMCA Test Figures

Figure 5.3 Illustrates a fully ducted damper. This configuration has the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.

Figure 5.2 Illustrates a ducted damper exhausting air into an open area. This configuration has a lower pressure drop than Figure 5.5 because entrance losses are minimized by a straight duct run upstream of the damper.

Figure 5.5 Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

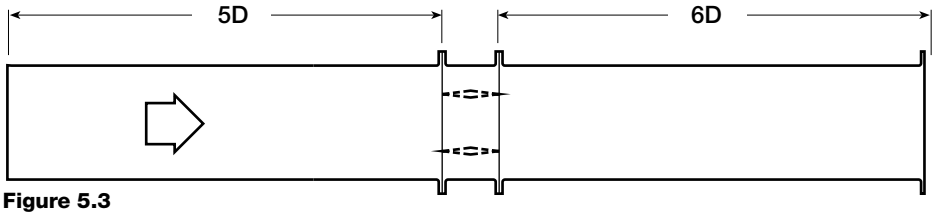


Figure 5.3

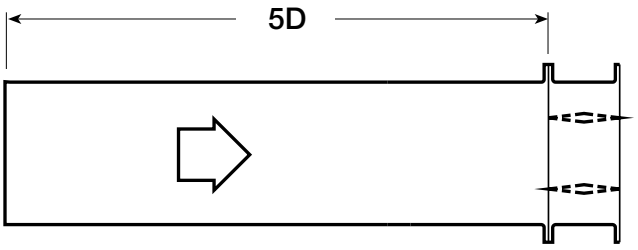


Figure 5.2

$$D \sqrt{\frac{4\,(W)\,(H)}{3.14}}$$

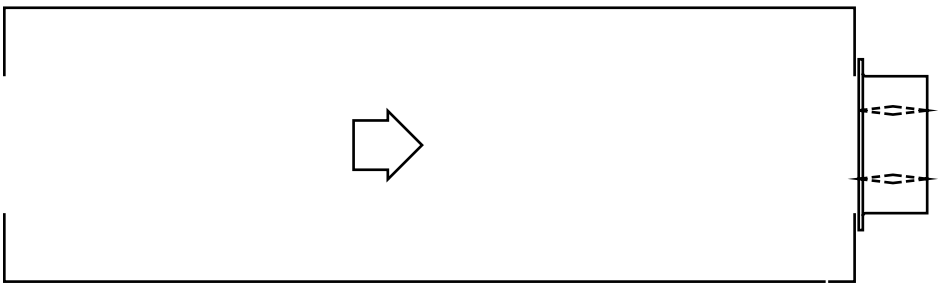
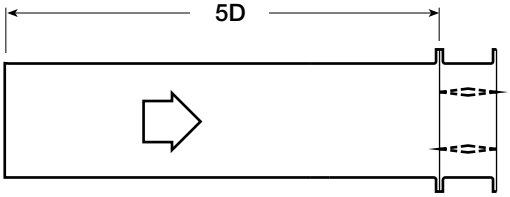
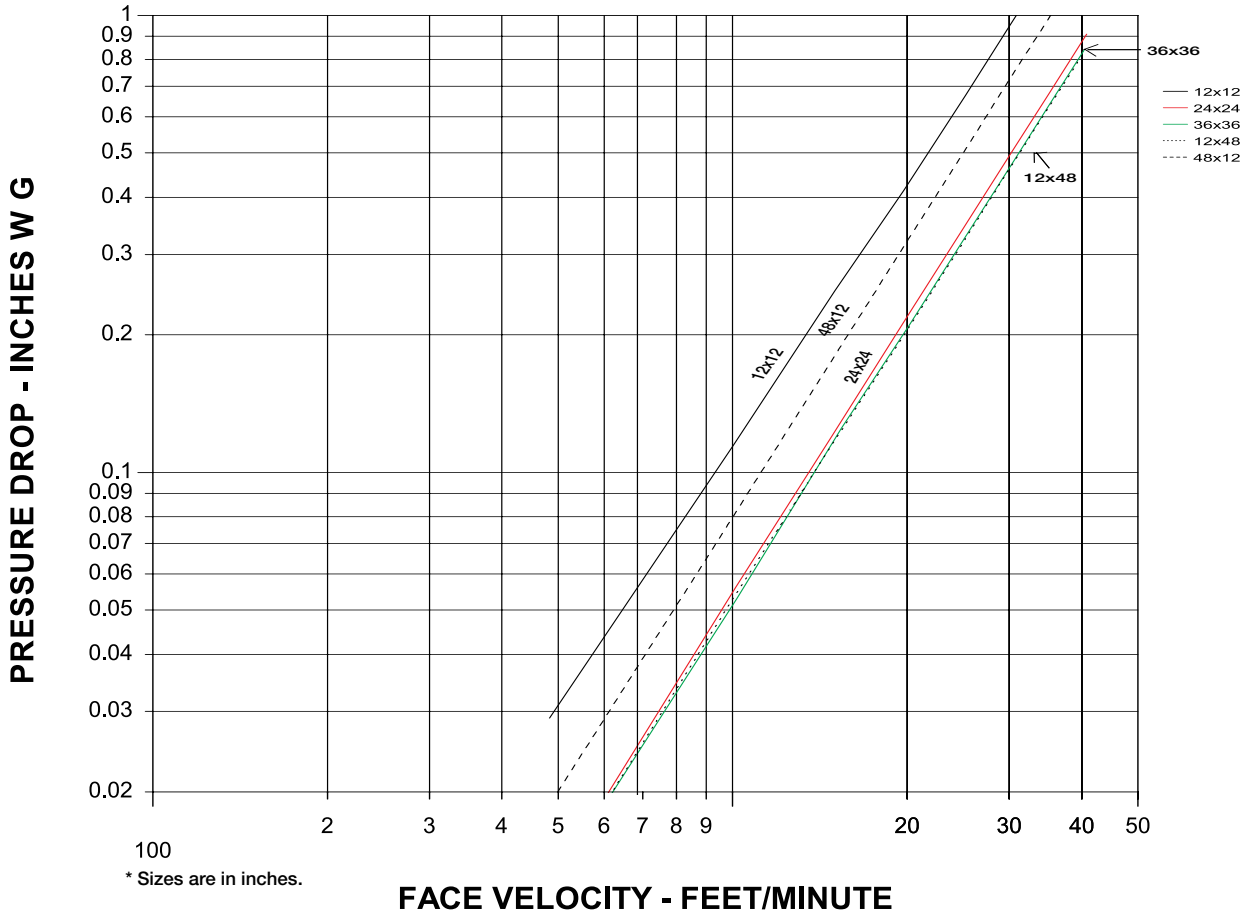


Figure 5.5

AMCA 5.2 Pressure Drop SMD-301M



VELOCITY VS. PRESSURE DROP



* Sizes are in inches.

FACE VELOCITY - FEET/MINUTE

AMCA FIG. 5.2

12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.12
1500	0.26
2000	0.46
2500	0.72
3000	1.04
3500	1.41
4000	1.84

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.06
1500	0.12
2000	0.22
2500	0.34
3000	0.49
3500	0.67
4000	0.87

36in. x 36 in. (914mm x 914mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.06
1500	0.12
2000	0.22
2500	0.34
3000	0.49
3500	0.67
4000	0.88

12in. X 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.05
1500	0.12
2000	0.21
2500	0.33
3000	0.48
3500	0.65
4000	0.85

48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.02
1000	0.08
1500	0.18
2000	0.33
2500	0.51
3000	0.74
3500	1.00
4000	1.31

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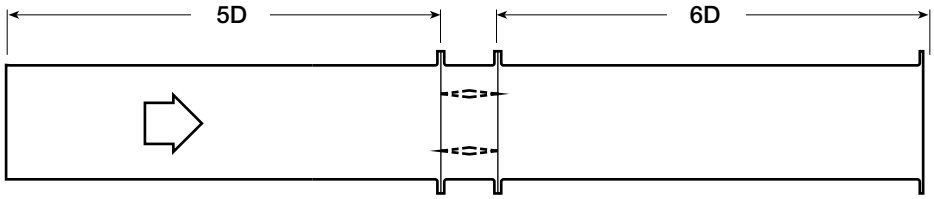
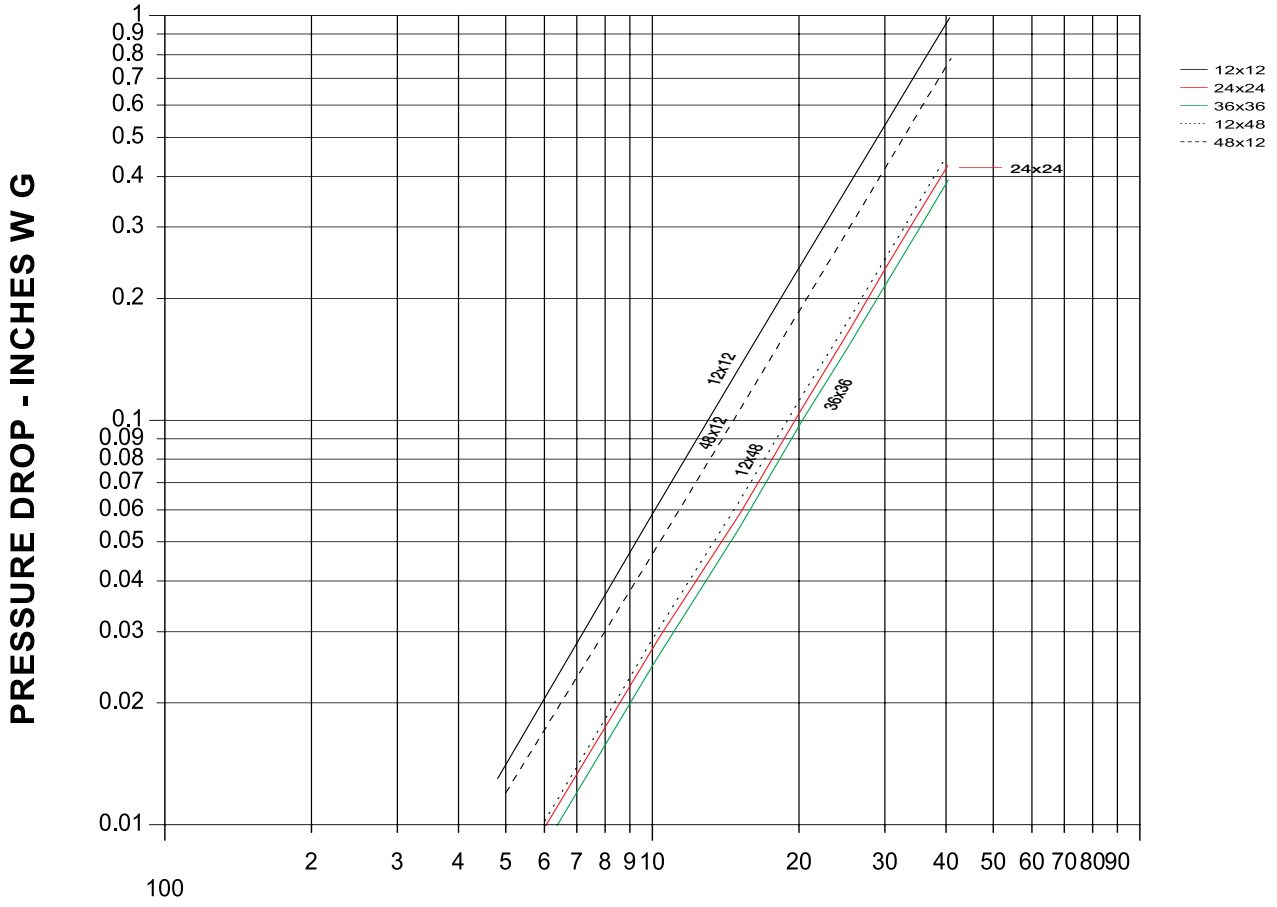
AMCA 5.3 Pressure Drop SMD-301M



VELOCITY VS. PRESSURE DROP



* Sizes are in inches.

FACE VELOCITY - FEET/MINUTE

AMCA FIG. 5.3

12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.06
1500	0.13
2000	0.23
2500	0.37
3000	0.53
3500	0.73
4000	0.95

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.06
2000	0.10
2500	0.16
3000	0.23
3500	0.32
4000	0.42

36in. x 36 in. (914mm x 914mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.05
2000	0.09
2500	0.14
3000	0.21
3500	0.29
4000	0.38

12in. X 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.06
2000	0.10
2500	0.16
3000	0.24
3500	0.33
4000	0.43

48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.04
1500	0.10
2000	0.18
2500	0.29
3000	0.42
3500	0.57
4000	0.74

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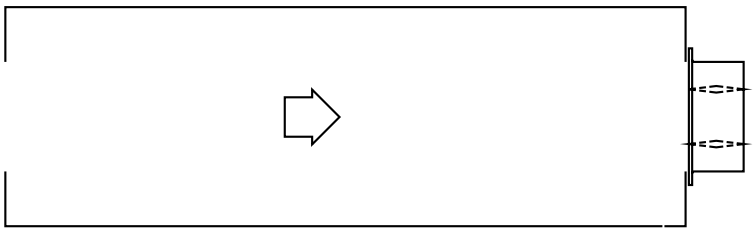
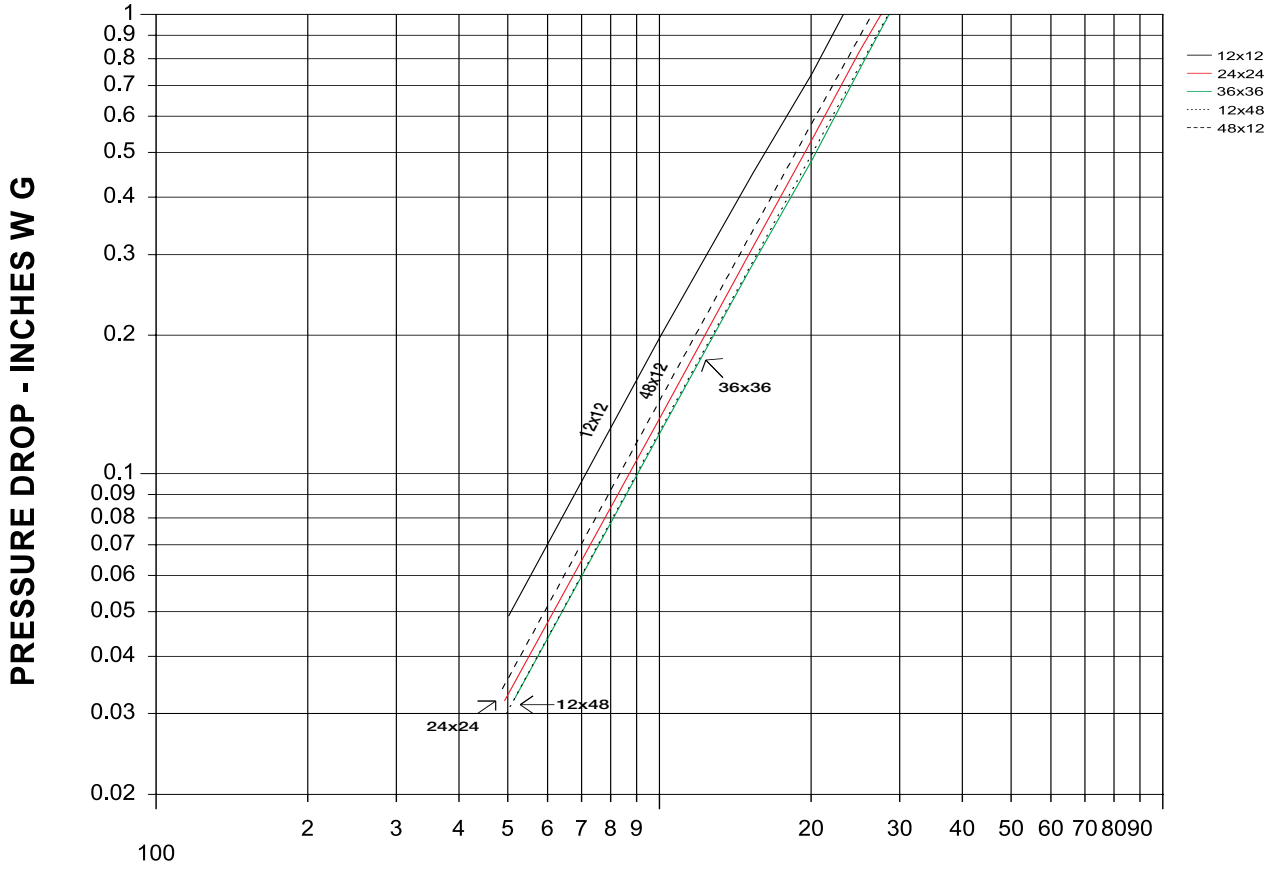
AMCA 5.5 Pressure Drop SMD-301M



VELOCITY VS. PRESSURE DROP



FACE VELOCITY - FEET/MINUTE
AMCA FIG. 5.5

12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.04
1000	0.18
1500	0.42
2000	0.75
2500	1.17
3000	1.68
3500	2.29
4000	2.09

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.13
1500	0.29
2000	0.52
2500	0.81
3000	1.17
3500	1.60
4000	2.14

36in. x 36 in. (914mm x 914mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.12
1500	0.27
2000	0.48
2500	0.75
3000	1.08
3500	1.48
4000	1.93

12in. X 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.12
1500	0.27
2000	0.49
2500	0.77
3000	1.11
3500	1.51
4000	1.97

48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.14
1500	0.32
2000	0.57
2500	0.89
3000	1.28
3500	1.75
4000	2.29

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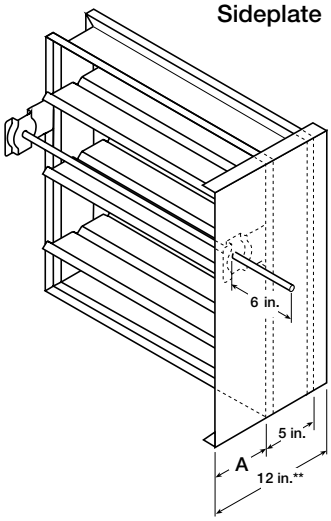
Application Data

Damper Sideplate and Sleeve Dimensional Data

The drawings below illustrate the factory standard sideplate and sleeve mountings for the SMD-301M. The standard "A" dimensions listed in the table provide adequate space for the mounting of actuators and controls.

If space constraints are a problem the "A" dimension can be varied between 5 3/8 in. (136mm) and 12 in. (305mm).

Sideplate

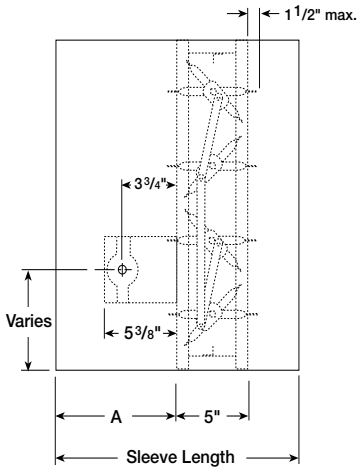


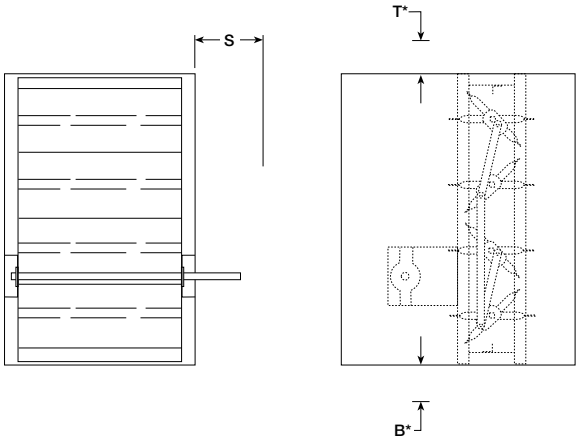
in. (mm)	"A" Dimension		
	Sleeve		Sideplate
	Standard	Maximum	
All Dampers*	7 3/16 (183)	12 (305)	6 3/16 (157)
When height is 11 in. (279) or less with OCI	11 3/16 (284)	12 (305)	10 3/16 (259)

*With the exception of dampers 11 in. (279mm) high or less (12 in. (305mm)high or less if width is greater than 64 in. (1625mm)) with OCI option.

** On dampers 11 in. (279mm) high or less (12 in. (305mm)high or less if width is greater than 64 in. (1625mm)) with OCI option, sideplate is 16 in. (406mm)

Sleeve





Space Envelopes Required for Actuators and Accessories

Externally mounted actuators always require space outside of the damper sideplate or sleeve. The “S” dimension illustrates the clearance required for various available actuators.

On dampers less than 18 in. (457mm) high, actuators may also require clearances above and/or below the sideplate or sleeve. “B” and “T” dimensions are ***worst*** case clearance requirements for some dampers less than 18 in. (457mm) high. All damper sizes under 18 in. (457mm) high do not require these worst case clearances. If space availability above or below the damper sleeve is limited, each damper size should be individually evaluated.

Actuator Type/Model	B*	T*	S
	With OCI, RRL, or TOR	With OCI, RRL, or TOR	
24 Volt AC			
MS7520A2015/B MS7520A2213/B	6 in. (152mm)	3/8 in. (10mm)	6 in. (152mm)

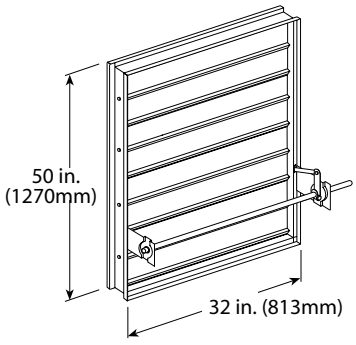
* For dampers 18 in.(457mm) or more in height these dimensions are 0 in.

Damper Sizing Information

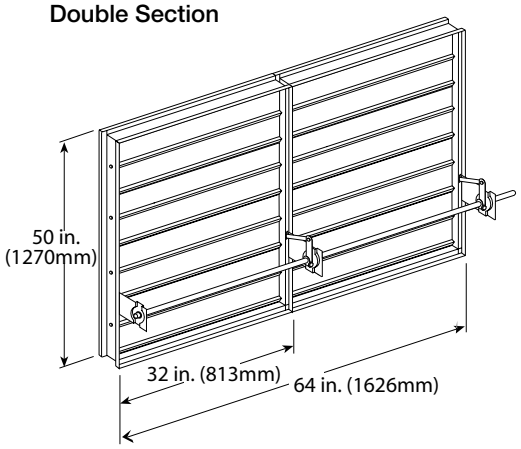
Dampers larger than maximum single section size are supplied as a factory assembly of two or more sections of equal size.

The following figures show damper sections and assemblies that have been qualified for operation with a single actuator. Larger sizes can be accommodated using multiples of these assembles.

Single Section

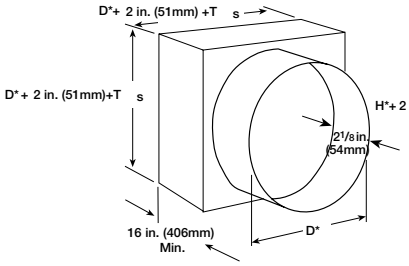


Double Section

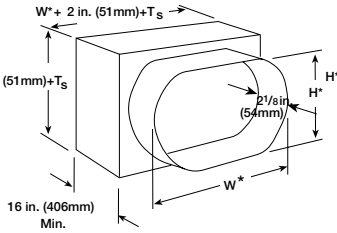


Transitioned Damper Dimensions

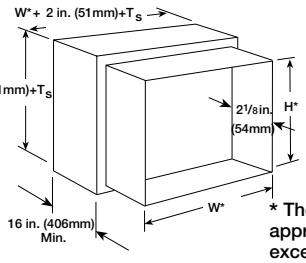
When a fire/smoke damper is being used in conjunction with round or oval ductwork, the SMD-301M can be supplied in a factory sleeve with round or oval transitions on both ends of the sleeve. Dampers should be ordered to the duct dimensions. Drawings below show overall damper size.



TYPE R



TYPE O



TYPE C

* These dimensions are furnished approximately 1/4 in. (6mm) undersize, except round and oval dimensions which are approximately 1/8 in. (3mm) undersize.

T_S = (2)(Sleeve Thickness)

Specifications

Smoke Dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules. Dampers shall meet the requirements of NFPA 92A, 92B, 101 and 105 and further shall be tested, rated and labeled in accordance with the latest edition of UL Standard 555S. Smoke dampers shall be of low leakage design qualified to UL 555S Leakage Class I.

Each damper/actuator combination shall have a UL555S elevated temperature rating of 250°F (121° C) minimum and shall be rated to operate at maximum design air flow at its installed location. Each damper shall be supplied with an appropriate actuator installed by the damper manufacturer at the time of damper fabrication. Damper actuator shall be (specifier select one of the following) electric type for 24 Volt operation.

Damper blades shall be of the double skin airfoil type and shall have an equivalent metal thickness of 14 ga.(2mm). Damper frame shall be galvanized steel formed into a structural hat channel shape with reinforced corners. Bearings shall be sintered bronze sleeve type rotating in extruded holes in the damper frame. Blade edge seals shall be silicone rubber designed to inflate and provide a tighter seal against leakage as pressure on either side of the damper increases. Jamb seals shall be stainless steel compression type. Blades shall be completely symmetrical relative to their axle pivot point, presenting identical resistance to airflow in either direction or pressure on either side of the damper.

Damper must be rated for mounting vertically (with blades running horizontal) or horizontally and be UL 555S rated for leakage and airflow in either direction through the damper.

The basis of design is Greenheck Model SMD-301M.

GREENHECK

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